

# ● PRINTER RUSH ●

## (PTO ASSISTANCE)

Application : <u>10/705318</u>	Examiner : <u>TON</u>	GAU : <u>2871</u>
From : <u>MR</u>	Location : <u>IDC</u> FMF FDC	Date : <u>05-25-05</u>
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DOC CODE	DOC DATE	MISCELLANEOUS
<input type="checkbox"/> 1449	_____	<input type="checkbox"/> Continuing Data
<input type="checkbox"/> IDS	_____	<input checked="" type="checkbox"/> Foreign Priority
<input type="checkbox"/> CLM	_____	<input type="checkbox"/> Document Legibility
<input type="checkbox"/> IIFW	_____	<input type="checkbox"/> Fees
<input type="checkbox"/> SRFW	_____	<input type="checkbox"/> Other
<input type="checkbox"/> DRW	_____	
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<input type="checkbox"/> 312	_____	
<input type="checkbox"/> SPEC	_____	

[RUSH] MESSAGE: ① Foreign Priority (EPD 99202351.5) claim  
is over the 1 year filing date of this application.  
Please advise.  
Thank you.

[XRUSH] RESPONSE: PCT information corrects above.  
See new ltr sheet and amendment  
to p. 1 of specification.  
 INITIALS: JBH

NOTE: This form will be included as part of the official USPTO record, with the Response document coded as XRUSH.  
 REV 10/04

Liquid crystal display device

## CROSS REFERENCE TO RELATED APPLICATIONS

*JBH  
5-31-05*  
This is a divisional application Ser. No. 09/787249, filed Mar. 16, 2001, which is a 371 of PCT/EP00/06587, filed July 11, 2000.

The invention relates to a liquid crystal display device having, between a polarizer and an analyzer, a first layer of twisted liquid crystal material with a twisted structure between two transparent substrates, with pixels being realized between the substrates, and a compensator layer. Such display devices are generally used in, for example, automotive displays, but also in monitors, etc.

An example of such a display device is shown in, for example, USP 5,287,207. This patent shows a double cell in which a second cell functions as a compensator in order to obtain an optimum contrast. Although a satisfactory contrast is obtained in these types of display devices upon perpendicular passage of the light, it appears that there is a considerable grey scale inversion in such a double cell, when viewed at an angle.

It is, inter alia, an object of the present invention to reduce or eliminate said grey scale inversion.

To this end, a display device according to the invention is characterized in that a pixel comprises at least two sub-pixels having the same twist and, viewed transversely to the substrates, twist angles which are rotated with respect to each other. The twist angles, viewed transversely to the substrates, are rotated substantially 180 degrees with respect to each other. The effects on the grey scale of one sub-pixel are then compensated, as it were, by the effects of the other sub-pixel. Also in the case of rotations different from 180 degrees, an enhancement is obtained dependent on the type of usage (for example, in cockpit applications or in applications where a display device is viewed by different persons from two directions).

The twist angles are preferably in the range between 50 and 100 degrees.

A first preferred embodiment of a liquid crystal display device according to the invention is characterized in that the compensator layer has a twisted structure with a twist which is opposite to that of the layer of twisted liquid crystal material. The compensator layer preferably has a twist angle which is opposite to that of the layer of twisted liquid crystal material.



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Bib Data Sheet

CONFIRMATION NO. 4463

<b>SERIAL NUMBER</b> 10/705,318	<b>FILING OR 371(c) DATE</b> 11/10/2003 <b>RULE</b>	<b>CLASS</b> 349	<b>GROUP ART UNIT</b> 2871	<b>ATTORNEY DOCKET NO.</b> PHN17,537A	
<b>APPLICANTS</b> Sjoerd Stallinga, Eindhoven, NETHERLANDS; Peter Van De Witte, Heerlen, NETHERLANDS;					
<b>** CONTINUING DATA *****</b> This application is a DIV of 09/787,249 03/16/2001 PAT 6,674,498 * which is a 371 of PCT/EP00/06587 07/11/2000 (*)Data provided by applicant is not consistent with PTO records.					
<b>** FOREIGN APPLICATIONS *****</b> EUROPEAN PATENT OFFICE (EPO) 99202351.5 07/16/1999					
<b>IF REQUIRED, FOREIGN FILING LICENSE GRANTED</b> <b>** 02/12/2004</b>					
Foreign Priority claimed <input type="checkbox"/> yes <input type="checkbox"/> no 35 USC 119 (a-d) conditions <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> Met after met Allowance Verified and Acknowledged <u>Examiner's Signature</u> <u>Initials</u>		<b>STATE OR COUNTRY</b> NETHERLANDS	<b>SHEETS DRAWING</b> 5	<b>TOTAL CLAIMS</b> 3	<b>INDEPENDENT CLAIMS</b> 1
<b>ADDRESS</b> Corporate Patent Counsel Philips Intellectual Property & Standards P.O. Box 3001 Briarcliff Manor ,NY 10510-8001					
<b>TITLE</b> LIQUID CRYSTAL DISPLAY DEVICE					
<b>FILING FEE RECEIVED</b> 1070	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:		<input type="checkbox"/> All Fees <input type="checkbox"/> 1.16 Fees ( Filing ) <input type="checkbox"/> 1.17 Fees ( Processing Ext. of time ) <input type="checkbox"/> 1.18 Fees ( Issue ) <input type="checkbox"/> Other _____ <input type="checkbox"/> Credit		